IN-VEHICLE INFOTAINMENT SYSTEM
We have developed one of the most advanced In-Vehicle Infotainment (IVI) systems including both hardware and software. The multi-platform IVI enables extremely fast and efficient development as well as easy system customization according to customer requirements and within set deadlines.

THE MAIN FEATURES OF THE SYSTEM:

- **FAST IMPLEMENTATION** of different graphics, display sizes and features thanks to proprietary HW and SW
- **INTEGRATED INTERNET CONNECTIVITY** (3G/WiFi M2M System) for remote diagnostics, software updates, internet media streaming, web browsing and remote control (via smartphone app and web interfaces)
- **ADVANCED FEATURES** such as off-line 3D navigation, real-time vehicle telemetry, surround view-camera system etc.
IMPLEMENTED SYSTEMS

EXAMPLE OF PREVIOUS PROJECTS

Electric Supercar
Design and development of a two-screen IVI system for an electric supercar.

Innovative Watercraft
Design and development of a waterproof and sun-readable IVI system including connectivity features for a personal watercraft.

Autonomous Vehicle Prototype
Design and development of an IVI system for an autonomous (driverless) vehicle based on mobile Android platform for a global technology company.

Prototype Car With In Wheel Motor
Design and development of an IVI system for an electric B-segment prototype car with powerful in-wheel-motors and drive-by-wire systems.
IMPLEMENTED SYSTEMS
EXAMPLE OF PREVIOUS PROJECTS

The Worlds Most Expensive Supercar
Design and development of the holographic Infotainment system for the world’s most expensive car.

The Most Advanced Electric Bicycle
Design and development of an IVI system for our Greyp electric bicycle.

Fully Electric Race Car
Design and development of an IVI system for a fully electric race car for Tajima Motor Corporation from Japan.

Concept One
Design and development of a 3-display IVI system for the world’s first electric supercar.
CONCEPT_ONE
CLUSTER DISPLAY

The Concept_One cluster display revolutionizes classical instrumentation dashboards by using all the possibilities of digital screens. Gauges and indication lights are not static, but adapt to user preferences and the context in which the vehicle is being used.

ON THE TRACK cluster shows important performance information.
ON THE HIGHWAY it presents basic vehicle information and focuses on entertainment.
WHEN USING THE NAVIGATION and entering the address, it switches to a navigation intensive mode.
WHEN GOING IN REVERSE it switches to the rear view camera mode.

IT IS ALL ABOUT SHOWING THE RIGHT INFORMATION AT THE RIGHT MOMENT.
IN THE HEART OF CONCEPT_ONE IVI SYSTEM IS THE CENTRAL DISPLAY.
ITS HIGH RESOLUTION MULTI-TOUCH DISPLAY INTEGRATES A VAST SET OF FEATURES AND POSSIBILITIES.
CONCEPT ONE
CENTRAL DISPLAY - PERFORMANCE

The IVI presents detailed information on all important vehicle systems with integrated real-time telemetry.
For more in depth analysis of car performance, the IVI system logs about 50 parameters and present them to the driver in the form of graphs.
CONCEPT ONE

CENTRAL DISPLAY - SETTINGS

The IVI system communicates with all relevant vehicle systems in order to access multiple vehicle functions through one screen. It is, for example, possible to adjust the suspension height, button illumination color, power distribution and steering assistance in one single settings tab.
Cars are becoming more and more connected. There are huge advantages in having a connected car both for the car owner and the manufacturer. Owners get access to information and media, like live traffic reports or Internet radio. Manufacturers can collect telemetry information, for vehicle health monitoring, or for remote maintenance like software updates.

Rimac Automobili IVI system has two connectivity channels:
- GPRS/3G for on road Internet connectivity
- WiFi for faster stationary connection
The M2M system collects data from more than 500 vehicle sensors and transmits them to the manufacturer servers in real-time.

The collected data is stored on servers and available for real-time review through dashboards or accessible on-demand for later analysis.

The M2M system also allows remote control of certain vehicle functions. The system can control customer-relevant vehicle properties, like turning on the climate control, or it can change internal vehicle settings like cooling strategies or BMS settings.
The Rimac Automobili IVI System incorporates a 3D navigation system developed in collaboration with our navigation system partner Mireo d.o.o.

The navigation is based on an offline (on-board) system. The system uses NAVTEQ (HERE) navigation maps as well as those by local providers. Maps are available for 130 countries.

The system provides a fast and smooth user experience with a rich feature set that equals and exceeds those of other professional navigation systems.

Being an offline system, there are no roaming costs for customers and the app will function optimally regardless of the quality or absence of cell reception.

With the connectivity option, the Rimac Automobili IVI system integrates Live Traffic data, Google Street View, Facebook and Foursquare Places search.

The navigation is localized in many languages including all Western languages, Hebrew and Arabic. Turn-by-turn voice instructions are available in 53 languages.
SEARCH
• A single, unified search field
• Search by address, POI, city, geo-coordinate and post code
• POI search by name, category, address or any combination of these
• Search for intersecting streets, longitude/latitude
• Address search across multiple cities
• Partial and mistyped input accepted
• Full 7-digit UK, 4-digit Dutch and Brazilian postal code support
• Full European postal code search and filtering

MAP DISPLAY
• Full multi-touch gestures supported in map view – select, pan, rotate and zoom with your fingertips
• Full 3D Terrain rendering for the entire world
• Realistic 3D Landmarks and Buildings
• 2D Building Footprints with 3D effect (building shoeboxes with actual heights)
• Map shown in day or night mode, automatically adapting to light conditions
• Multi-colored Live Traffic information overlaid on map

NAVIGATION
• Virtually instant route calculation
• Option to automatically avoid traffic when calculating a route
• Tap and hold on any point on a calculated route in the map display then drag your finger to change the route.
• The entire route is displayed on the map
• Three alternative routes are available and are shown next to each other on the map display
• Save and instantly view the traffic situation on frequently driven routes
• Easily add, remove and reorder multiple stops along a route
• Turn-by-turn voice instructions available in 53 languages
• Automatic rerouting using Live Traffic data
• Speed limit alerts
TECHNICAL SPECIFICATION
HW SYSTEM DESCRIPTION

BASIC MODULE INFORMATION
The Rimac Automobili IVI module has a quad core Cortex A9 CPU with maximum of 1.3GHz with all cores utilized. It has 1GB of RAM and 4GB of integrated flash. The entire system is Linux based distribution with X server.

MODULE CONNECTIVITY
> Display interface
  - The module has 3 interfaces:
    1. HDMI: up to 1920x1080@60Hz
    2. RGB: up to 2048x1536 24bpp
    3. LVDS:
      - Connected to RGB interface through RGB-LVDS interface
      - Configurable for various displays through GPIO
      - Up to 1920x1440 24bpp in dual channel configuration
      - Up to 1280x1024 24bpp in single channel configuration
  - It is possible to connect up to 2 displays to a single IVI module in the following configurations:
    1. HDMI+RGB
    2. HDMI+LVDS

> CAN
  - Speed up to 1Mbps
  - 2500V isolation
  - Isolated DC/DC power supply

> PCIe
  - One mSATA connector for SSD disk

> USB
  - USB 2.0 Full speed supported for various devices

> UART
  - 4 UART ports available
  - Up to 4Mbaud
  - Both RS232 and TTL levels are available
  - One port is used to communicate with supervisor circuit

> GPIO (8x)
  - 12V, 5V or 3.3V selectable IO levels
  - Overcurrent, Overvoltage and ESD protection
  - Maximum output current 5A
  - Each GPIO is IO selectable
TECHNICAL SPECIFICATION
HW SYSTEM DESCRIPTION

SUPERVISOR CIRCUIT FEATURES
- Constantly checks status of main module
- Integrates IO protection and driver circuitry
- Provides flexible GPIO setup
- Integrates USB switch circuitry for better power savings performance
- Integrates power supply for IVI module and displays with filters to maximize ripple rejection and stable power flow
- Regulates power state
TECHNICAL SPECIFICATION
REFERENCE SYSTEM CONFIGURATION

CONCEPT ONE IVI REFERENCE SYSTEM
• Two independent IVI systems used for maximum performance
• Communication with other car systems via CAN and/or UART (optical fibers are used for UART communication for maximum EMI immunity)
• Central display with integrated multi-touch capacitive touch panel

**Diagram**

- **IVI module 1**
  - Cluster display 1280x480
  - CAN/UART(FO)
  - HDMI
  - USB

- **IVI module 2**
  - Central display with P-CAP
  - 800x1280
  - CAN/UART(FO)
  - HDMI
  - USB

- **VCU**